



2009

Striving Readers Years 1 & 2 Evaluation Report: Danville, Kentucky

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Executive Summary of Findings: Implementation and Impact

This Striving Readers evaluation is occurring in ten middle, nine high, and two 6-12 schools in seven rural school districts serving large percentages of at-risk students in Kentucky. It examines the impact of a targeted intervention, the Learning Strategies Curriculum (LSC) developed by the University of Kansas Center for Research on Learning, on struggling middle and high school students' reading achievement, strategy use, and motivation. The intervention is a supplement to the regular curriculum wherein students in the targeted intervention participate in an extra class period per day over the course of the school year. The control-group condition is "business as usual."

In addition to the targeted intervention, this study evaluates a whole-school intervention, the Collaborative for Teaching and Learning Adolescent Literacy Model (ALM) on teacher and student outcomes. This school-wide model provides professional development for content teachers in how to integrate literacy strategies across content areas in service of content learning. All teachers in the Striving Readers schools are expected to implement the whole-school intervention, and all students should receive instruction in the whole-school techniques across the content areas.

In this Striving Readers project, each school employs a literacy coach who is responsible for both teaching the targeted intervention to struggling readers *and* for coaching content teachers in implementing the whole-school intervention¹. Through the project, these coaches have the opportunity to participate in a literacy leadership certification program through the University of Louisville.

The research questions that motivated the study design and analysis plan during the first two years are:

- What is the impact of the LSC on the reading achievement, strategy use, and motivation of struggling adolescent readers?

¹When describing the intervention teacher's role, we will refer to the literacy coach as the "LSC teacher," and when describing the whole-school program coach's role, we will refer to the literacy coach as the "ALM coach".

- What is the impact of the ALM on teachers' personal and collective efficacy for literacy teaching?

LSC Targeted Intervention

This study examined both the implementation and impact of the LSC in years one and two of the Striving Readers project.

Implementation. During both years, LSC teachers participated in training and on-site support, and training was provided for school administrators. In year one, LSC teachers were provided seven days professional development training and up to 45 hours support from visits by mentor coaches. In year two, the LSC teachers were provided seven and one-half days training and up to 48 hours of on-site support. Mentor coach site visits decreased from year one to year two, as expected. School administrators were provided a total of three-and-one-half days training in the intervention in years one and two. Overall, according to project leaders, participation in the professional development inputs for middle, high, and 6-12 LSC teachers and administrators was adequate.

Classroom implementation fidelity was measured through classroom observations and by calculating the percentage of days that students received instruction by a trained LSC teacher (teacher attendance). Observations indicated that fidelity to the targeted intervention was relatively low in year one. In year two, implementation fidelity increased to adequate levels; however teacher attendance decreased.

Impacts. This study used HLM analyses to measure the impacts of the LSC on sixth-grade (middle school) and ninth-grade (high school) students' reading achievement, strategy use, and motivation. In the first two years of this Striving Readers study, there were no impacts on students' reading achievement, as measured by the *Group Reading Assessment and Diagnostic Evaluation*, for sixth- or ninth-grade students. Results on the *Metacognitive Awareness of Reading Strategies Inventory* (Mokhtari & Reichard, 2002) indicated significant impacts for sixth grade on students' self-reported reading strategy use but revealed no significant impacts on strategy use for ninth grade. Results on the *Motivation to Read Questionnaire* (Wigfield & Guthrie, 1997) indicated significant effects for both sixth- and ninth-grade students in the area of reading motivation.

ALM Whole-School Intervention

In the first two years, this Striving Readers study examined the implementation of the ALM and its impacts on content teachers' personal and collective efficacy for literacy teaching.

Implementation. The professional development inputs for the whole-school intervention were multi-faceted, as training was provided for content teachers, ALM coaches, and school administrators. In year one, all content teachers were expected to attend a five-day summer institute on the whole-school intervention, and overall, high levels of participation were

evident. In year two, content teachers received additional professional development through two days training plus discipline-specific training for groups of teachers, as needed. According to the ALM developer, in year two the percentage of teachers who participated in the whole-school training decreased somewhat, though levels remained adequate (or nearly so). ALM coaches were provided twelve days of training in the school-wide intervention in year one and nine-and-one-half days of training in year two; their participation was deemed adequate in both years, overall. In addition, ALM coaches were provided up to 45 hours of on-site support by a mentor coach in year one and up to 48 hours of support in year two. School administrators were provided seven days professional development in the school-wide model in year one and three-and-one-half days in year two. Overall, administrators' participation was deemed adequate in both years.

In year one, all English/Language Arts (E/LA) teachers were observed to judge their fidelity to the whole-school model, and in year two, E/LA teachers and a sample of teachers in other content areas were observed. In year one, middle- and high-school E/LA teachers implemented the ALM at similar levels, spending approximately one-quarter of class time using ALM techniques. In year two, high-school E/LA teachers' implementation decreased. Also, middle-school teachers in other content areas implemented the whole-school model at much higher levels than did high-school content teachers.

Impacts. All content teachers in Striving Readers schools and teachers in matched schools (11 schools in year one and eight in year two) completed a teacher efficacy survey at the start of the project, at the end of year one, and at the end of year two. ANOVA procedures indicated that, while there was no significant difference over time and between treatment groups, there was a significant interaction between time and treatment conditions. This indicates that Striving Readers teachers started with lower personal and collective efficacy than the teachers at the matched schools, and ended with higher levels of efficacy. In addition, there is some evidence that collective efficacy at matched schools decreased over time.

Conclusions

In the first two years of this Striving Readers project, literacy coaches, administrators, and content area teachers achieved adequate levels of participation in the professional development inputs, overall, for both the targeted intervention and whole-school model. However, there was more variation in the levels of classroom implementation of the targeted and whole-school interventions. For the targeted intervention, implementation was relatively low in year one but improved to adequate levels in year two. For the school-wide model, implementation by E/LA teachers decreased in year two. Implementation by middle school teachers in other content areas was adequate in year two (according to the developer), but implementation by high school teachers was low.

While levels of classroom implementation fidelity to the models have been inconsistent, the first two years of the Striving Readers project have yielded positive impacts on students and teachers. In particular, the targeted intervention (LSC) seems promising for impacting the

reading strategy use of sixth-grade struggling readers. In addition, LSC had a positive effect on both sixth- and ninth-grade students' reading motivation. While the targeted intervention appeared to have no impact on students' reading achievement in years one and two, there was insufficient power to detect these impacts. Thus, impacts on student achievement may be realized in future years of the Striving Readers study.

Introduction and Study Background

Context for the Study

In the first two years, the Danville, Kentucky Striving Readers project involved ten middle schools, nine high schools and two 6-12 schools in seven rural school districts. One of the 6-12 schools is an alternative school for students who have not succeeded in a traditional middle and high school setting. Student populations within these schools ranged in size from 30 to 1,252 with a mean of 580 students per building. The school demographics are shown in Table 1.1 for years 1 and 2. With the possible exception of Title 1 designation, there were very few changes from the first to second year.

Table 1.1

School Demographics

	Number of Schools	Title 1 Schools	Free/ Reduced Lunch	White	African American
<i>Year 1</i>					
Middle Schools	10	50%	50.9%	91.1%	5.6%
High Schools	9	11%	42.0%	89.0%	7.0%
6 – 12 Schools	2	50%	60.0%	89.6%	6.4%
<i>Year 2</i>					
Middle Schools	10	60%	50.8%	89.2%	6.6%
High Schools	9	0%	38.9%	89.2%	7.3%
6 – 12 Schools	2	100%	61.5%	89.2%	6.9%

Theoretical Rationale for and Description of the Intervention Models

Targeted Intervention. The targeted intervention for the Danville project was the Learning Strategies Curriculum (LSC), developed by the University of Kansas Center for Research on Learning (KU-CRL) as one component of the Strategic Interventions Model (SIM) (Tralli, Colombo, Deshler, & Schumaker, 1996). The LSC was developed to assist adolescents with learning disabilities in the general education classroom and is divided into three strands: (a) Acquisition, (b) Storage, and (c) Expression. Each strand includes a number of strategies designed to help students derive information from texts, identify and remember important information, or develop writing or academic competence. Each strategy is taught through eight instructional stages: pretest and commitments, describe, model, verbal practice, controlled practice and feedback, posttest and commitments, and generalization.

The acquisition strand is geared toward helping students gain information from text. This strand includes strategies such as Word Identification, Visual Imagery, Self-Questioning, and Paraphrasing. In general, previous research has examined the Learning Strategies Curriculum strategies for acquiring information from text and has shown positive results when used for students with learning disabilities in grades seven through twelve (Clark, Deshler, Schumaker, Alley, & Warner, 1984; Lee & Von Colln, 2003; Lenz & Hughes, 1990; Schumaker & Deshler, 1992; Woodruff, Schumaker, & Deshler, 2002).

The strategies in the storage strand are designed to help students identify, organize, and store important information. The storage strand includes the following strategies: FIRST-letter Mnemonic, Paired-Associates, and the LINC'S Vocabulary Learning Strategy. Previous studies have suggested the effectiveness of the FIRST-letter Mnemonic and Paired Associates strategies, which are designed to help students remember information (Bulgren, Hock, Schumaker, & Deshler, 1995; Nagel, 1982). As well, the LINC'S Vocabulary Learning Strategy, which involves using a mnemonic to memorize word meanings, has yielded positive results in previous research studies (see Ellis, 1992).

The expression strand includes strategies for assisting students with writing and academic competence. It includes the Sentence Writing Strategy, the Paragraph Writing Strategy, the Error Monitoring Strategy, the InSPECT strategy, the Theme Writing Strategy, the Assignment Completion Strategy, and the Test-Taking Strategy. Studies of individual Expression Strand strategies have demonstrated improved sentence writing (Kline, Shumaker, & Deshler, 1991) paragraph organization (Moran, Schumaker, & Vetter, 1981), revising and editing (McNaughton, Hughes, & Ofiesh, 1997), and theme writing (Hock, 1998).

Theoretically, the pedagogical tenets underlying the LSC are grounded in notions related to self-regulated learning, generalization, and motivation. The primary goal is teaching students "how to learn" (Schumaker & Deshler, 1992; Schumaker & Deshler, 2006). This is accomplished by teaching students a variety of task-specific learning strategies that enable them to deal with the immediate demands of the school curriculum and the self-regulatory processes needed to successfully transfer these skills to other contexts (Deshler & Schumaker, 1986; Schumaker &

Deshler, 2006). Thus, students are taught metacognitive skills that enable them to monitor progress made toward achieving goals (Deshler, Warner, Schumaker, & Alley, 1983; Flavell, 1979) and that enable them to control their own learning and thinking (Baker & Brown, 1984; Deshler et al., 1983). Personal attributions are important to this process in that students must accept responsibility for their own learning (Deshler & Schumaker, 1986) and develop the intrinsic motivation necessary to transfer their knowledge of strategies and how to use them to new situations and settings (Garner, 1990; Schumaker & Deshler, 1992).

In the Danville project, sixth- and ninth-grade students who scored two grade levels or more below grade level in reading received a minimum of 250 minutes per week of supplemental reading instruction in a targeted intervention class taught by an LSC teacher (who also serves the school-wide model as an ALM coach). Students were placed in this course in addition to their regular reading/language arts classes for an entire school year. During year one, 192 sixth-grade students and 250 ninth-grade students were selected to receive LSC instruction in the targeted intervention class. During year two, 177 sixth-grade students and 211 ninth-grade students were selected to receive the targeted intervention.

It is important to note that, due to scheduling necessities, some intervention classes met for longer than 250 minutes per week. In those classes, teachers were instructed to provide no more than 300 minutes of LSC instruction and to utilize the remaining time on other literacy activities.

The professional development model for the targeted intervention in year one included summer and follow-up training and on-site support from a mentor coach. To learn how to implement the targeted intervention, teachers participated in five half-day workshops in the summer which were led by a certified LSC trainer from the University of Louisville (U of L). During the school year, the trainer led the teachers in six half-day follow-up workshops (one each month). To support their ongoing learning and development, teachers participated in monthly coaching visits by mentor coaches from the Collaborative for Teaching and Learning (CTL) who were trained in the intervention alongside the teachers during the summer and over the course of the year. Also, the LSC trainer made visits to teachers who needed additional support. In year two, teachers participated in a two-day workshop to continue the training in the LSC model. During the school year, teachers participated in six half-day follow-up workshops (one each month). Teachers again had support from mentor coaches from CTL for approximately three to four days throughout the year and participated in bi-monthly distance learning sessions. The LSC trainer also made support visits on an as-needed basis.

It is important to note that the teachers for the targeted intervention also served as literacy coaches who supported the implementation of the school-wide model in their schools. As part of their training for the project, most of the teachers participated in a literacy coach certification training offered through U of L. Through this facet of the training, they completed three hallmark assessments designed to support their work as literacy coaches for the school-wide model as well as to further develop their skills as targeted intervention teachers. In

addition, the intervention teachers fully participated in all training related to the school-wide model.

Whole-School Intervention. The whole-school intervention used in the Danville Striving Readers project was the CTL Adolescent Literacy Model (ALM), developed by CTL (Awbrey, 2008). The CTL Adolescent Literacy Model is designed to support cross-content teachers in regularly applying literacy strategies during instruction in service of content learning. It is a professional development-based program, in that it does not include a specific set of texts for teachers to implement. The model focuses on the following components: vocabulary development, reading comprehension, verbal fluency, writing to learn, writing to demonstrate learning, and academic dialogue.

All teachers in the Striving Readers schools were expected to integrate the ALM into their classroom instruction, across the curriculum and across grade levels (sixth through twelfth). It was expected that all teachers would use the ALM strategies to some extent to integrate literacy into the content areas.

All content area teachers in the Striving Readers schools received 30 hours (five days) of training related to administering the school-wide intervention (The CTL Adolescent Literacy Model; Awbrey, 2008) during the summer of 2006. Initial training was provided by the Professional Development Director from the CTL and five mentor coaches from the CTL staff. Additional assistance in the form of ongoing job-embedded professional development was provided throughout the year on a daily basis by ALM coaches in each building and the external mentor coaches from CTL.

During the 2007-2008 school years, CTL provided professional development training, mentoring, coaching development, and direct coaching of teachers. As a part of this work, CTL implemented a variety of activities, supported schools through a variety of ways, and gathered much information to be shared with Striving Readers partners, schools, and the field concerning successful implementation of a school-wide literacy model and coaching development process.

Key activities and observations in 2007-2008 included providing (a) two days of teacher training to full faculty in twenty-one project schools, with school-specific training agendas, based on observed needs of the school; (b) direct coaching training to school ALM coaches on coaching skills development, content area expertise, and support of the school-wide literacy model; (c) department-specific training opportunities for each participating school, with CTL content specialists conducting each 3-hour training session. In addition, CTL content specialists provided follow-up trainings as needed, and mentoring of ALM coaches in how to conduct formal sessions for specific departments in their schools; (d) ongoing ALM coach mentoring, with several interactions each month (as individual school needs dictated), focused on modeling coaching and training, co-constructing coaching activities, observing and providing feedback on coaching activities; (e) direct training and development for school literacy leadership teams; (f) facilitation in the development of schools' long-range literacy

plans, with follow-up support for monitoring the successful implementation of those plans; and (g) direct training for school and district administrators to support development of leadership skills, strategies, and tool application – in concert with the Project Director, Kathy Belcher. The University of Louisville provided direct training and coursework support for the reading intervention and foundations of literacy knowledge.

The professional development model included training and support for administrators, as well. In year one, school administrators were invited to participate in the full five-day school-wide model training with their faculties. In addition, four administrator training days were held, where administrators received professional development in literacy leadership to support both the targeted intervention and the school-wide model. In year two, administrators were invited to participate in the two-day model training with their faculties. During the school year they participated in monthly on-site mentor meetings, and attended four administrator training days.

Logic Models

Exhibit 1: Logic Model for the Target Intervention (See Appendix A).

Exhibit 2: Logic Model for the Whole-school Intervention (See Appendix B).

Key Evaluation Design Features

In years one and two, the evaluation is designed to measure the impact of the targeted intervention on student outcomes and the impact of the whole-school model on teacher efficacy. During the first two years, the study was guided by the following research questions:

- What is the impact of the LSC on the reading achievement, reading motivation, and reading strategy use of struggling readers?
- What is the impact of the ALM on teachers' efficacy for literacy teaching?

For the evaluation of the targeted intervention, data from cohorts of sixth- and ninth-graders are combined for analysis each year of four years. In both years one and two, sixth- and ninth-grade students were randomly selected for treatment and control. In years three and four, the third and fourth cohorts of sixth- and ninth-grade students will be randomly selected for treatment and control. Student outcome measures for the first two years' targeted intervention study are as follows:

- Group Reading Assessment and Diagnostic Evaluation (GRADE)
- Metacognitive Awareness of Reading Strategies Inventory (MARSI)
- Motivation to Read Questionnaire (MRQ)

The evaluation of the whole-school model involves yearly measurement of teachers' efficacy for literacy teaching as well as student achievement in reading and the content areas at the end of four years. The following teacher outcome measure was used in years one and two:

- Teacher Efficacy Survey

The following student achievement measure will be used at the end of year four:

- Kentucky Core Content Test

Evaluation of the Implementation of the Targeted Intervention: Years One and Two

Summary of the Design of the Implementation Study

Exhibit 3A displays the research questions that guided the implementation study of the targeted intervention in years one and two. Exhibit 3B indicates the data sources that were used to answer each research question.

Exhibit 3A.

Research Questions for the Year 1 and 2 Implementation Study of the Targeted Interventions

What was the level of implementation of professional development/support for teachers/coaches/leaders in Year 1 and 2?

What type and amount of professional development was provided to intervention teachers and what was the average level of participation?

What type and amount of coaching was provided to intervention teachers and what was the average level of participation?

What was the average level of participation of district leaders in professional development?

What was the level of implementation of classroom instruction in Year 1 and 2?

What was the percentage of time that intervention teachers used the targeted instructional strategies with fidelity?

For what proportion of school days did students receive intervention instruction by a trained intervention teacher? (Teacher attendance)

Exhibit 3B.

Year 1 and 2 Data Sources on Implementation Linked with Research Questions: Targeted Intervention (Learning Strategies Curriculum)

Research Questions	Measures/Data Sources					
	Responsible Partner				Record Review	
	Developer of ALM model (CTL)	U of L trainer/LSC certified trainer	Project Director	Evaluator	PD attendance records	Surveys/Questionnaires/Logs/Classroom Observations
What was the level of implementation of professional development/support for intervention teachers/leaders in Year 1 and 2?						
What type and amount of professional development was provided to LSC teachers and what was the average level of participation?		●	●		●	●
What type and amount of coaching was provided to LSC teachers and what was the average level of participation?	●	●				●
What was the average level of participation of district leaders in professional development?			●		●	
What was the level of implementation of classroom instruction in Year 1 and 2?						
What was the average percentage of time that LSC teachers used the targeted instructional strategies with fidelity?				●		●
For what proportion of school days did students receive intervention instruction by a trained LSC teacher?			●			●

LSC Targeted Intervention Implementation Results

Professional Development Inputs. Table 1.2 shows the average participation of LSC teachers in professional development sessions and in coaching visits. As well, Table 1.2 shows the average number of days that school administrators attended training. Of the seven days training that were provided for LSC teachers in year one, middle and high school teachers attended an average of 6.6 days of training and the LSC teachers in the grades 6-12 schools attended all 7 days. In year two, attendance patterns were similar, in that 7.5 training days were provided, and middle school LSC teachers attended an average of 7 days, high school LSC teachers attended an average of seven of 7.1 days, and grades 6-12 school LSC teachers again attended all training days. The intervention trainer indicated that LSC teacher attendance of at least six days was adequate for each year, and the mean attendance patterns indicate that participation was adequate overall.

In addition to attending training sessions on the targeted intervention, LSC teachers received on-site mentoring by a CTL mentor coach. As is depicted in Table 1.2, middle school LSC teachers received an average of 5 days and 3.8 days of mentoring in the intervention in years one and two, respectively. High school LSC teachers received an average of 6.5 and 4.6 days in years one and two, respectively. LSC teachers in 6 - 12 schools received an average of 5.6 and 4.5 days of mentor coaching in years one and two, respectively. This represents a decrease in support for middle school and grades 6 - 12 school LSC teachers, and similar levels of support for high school LSC teachers. The CTL professional development director indicated that at least 2 days support was adequate, thus it appears that the level of support was adequate for both years.

Table 1.2

Means and Standard Deviations for Professional Development Inputs for Targeted Intervention by School

PD Inputs	PD Received	Year 1			Year 2		
		MS ^a	HS ^b	Grades 6 - 12	MS ^a	HS ^b	Grades 6 - 12
LSC Teacher Training							
Year 1, 7 days of PD	Av. no. of days						
Year 2, 7.5 days of PD	LSC teachers attended PD	6.6 (6.5 to 7)	6.6 (6.5 to 7)	7.0 (7 to 7)	7.0 (6.5 to 7.5)	7.1 (5.5 to 7.5)	7.5
	No. of LSC teachers ^d	10	12	2	10	12	2
Administrator Training							
	Av. no. of days admin. attended PD	1.7 (1 to 2)	1.7 (1 to 2)	1.8 (1.5 to 2)	1.3 (1 to 1.5)	1.3 (1 to 1.5)	1.5
	No. of administrators	10	9	2	10	9	2
Mentor Coaching							
	Av. no. of site visit days	5.0 (4.2 to 6.5)	6.5 (4.5 to 10)	5.6 (5.3 to 5.8)	3.8 (1 to 6)	4.6 (2 to 8)	4.5 (4 to 5)

Note. ^an = 10 middle schools; ^bn = 9 high schools; ^cn = 2 Grades 6 – 12 schools. ^dEvery school employed one Literacy Coach with the exception of three high schools, which had two Literacy Coaches each.

It is important to note that LSC teachers received support from mentor coaches through telephone calls, email correspondence, and formal distance support. This support was for both the targeted intervention and whole-school intervention. While documentation of this support was provided, the extent to which the support was specific to the targeted intervention or whole-school model was not designated. Overall, LSC teachers and mentor coaches engaged in 10,461 minutes of phone support calls, exchanged 2,410 emails, and participated 357 times in formal distance support.

In years one and two, school administrators were provided a total of three and one-half days of training on the targeted intervention. In year one, middle and high school administrators attended an average of 1.7 days training, and in year two they attended an average of 1.3 days. Administrators in 6 - 12 schools attended an average of 1.8 days in year one and 1.5 days in year two. Based on the level of adequacy set by the intervention trainer (at

least one day), middle and high school administrators' participation levels were adequate in both years one and two.

In addition to this training for LSC teachers (coaches) and administrators, many of the literacy coaches participated in a literacy leadership certification program offered by the University of Louisville. These coaches completed hallmark assignments as part of their certification program. There were two targeted intervention assignments in year one and one assignment in year two. Literacy coaches had to earn a B- or better on an assignment for it to be considered adequately completed. In year one, 60% of middle school coaches completed assignments adequately, and in year two 63.6% completed them adequately. In year one, 55.6% of high school teachers completed the assignments adequately, and 66.7% did in year two. One hundred percent of 6 - 12 school literacy coaches completed assignments adequately in year one and this decreased to 50% in year two. Of the coaches who had not completed the assignments, some had chosen not to participate in the certification program (perhaps because they did not perceive they needed the additional certification) and some had not yet completed the assignments but intended to do so eventually.

Process for Measuring Classroom Implementation. In the fall of 2006, research assistants attended a training session conducted by the LSC intervention trainer. Following that training, the research assistants and investigators worked collaboratively to create an observation protocol. First, they listed the eight instructional stages of the Learning Strategies Curriculum intervention (pretest and commitments, describe, model, verbal practice, controlled practice and feedback, posttest and commitments, and generalization). Second, they identified activities associated with each component. This section of the observation protocol would provide evidence that the eight stages of instruction were present. Interview questions were constructed to supplement observations. The investigators then constructed the observation protocol and sent it to the intervention trainer for feedback. The trainer made no suggestions for changes in the protocol. Four codes were developed to characterize the range of instructional behaviors observed in the intervention classrooms. Those codes included: (a) Learning Strategies Curriculum, (b) Other Literacy Activities, (c) Non-literacy Activities, and (d) Behavior Management.

The investigators then met with the research assistants to provide training related to taking field notes. Training consisted of lecture related to taking field notes, watching video segments, practice taking field notes, and critique. Sample field notes were shared, critiqued, and refined. The research assistants were trained to organize their field notes using five-minute time intervals to capture the nature of instruction throughout the entire lesson.

In November of 2006 research assistants went out in pairs and practiced taking field notes in three intervention classrooms. In December of 2006, the group reconvened and research assistants practiced coding the data one at a time, discussing the codes after each observation was coded. Agreement was discussed but not compiled/computed at this meeting.

During the spring of 2007 all LSC teachers were observed for at least one class period on two different occasions ($n = 47$ total observations). During the 2007-2008 academic year LSC teachers were again observed twice, once in the fall and again in the spring ($n = 46$ total observations). The purpose of these observations was twofold: (a) to determine treatment fidelity, and (b) to determine the extent to which LSC teachers implemented aspects of the LSC in their instruction. Observers sought and recorded evidence from the classroom environment, the observation, and an interview with the LSC teacher.

Four members of the evaluation team used the field notes to identify the number of minutes spent engaged in the LSC, Other Literacy Activities, Non-literacy Activities, and Behavior Management. These four researchers sought reliability for coding the observation protocols using 10.5% of the data ($n = 4$ observations). Inter-rater reliability was 89.8% among all four coders. Two of the coders then coded all remaining intervention observations. Overall, a total of 2,414 minutes of intervention instruction was observed and coded. In year two, the same four team members achieved 92% percent agreement using five of 46 observations (10.9% of the data). Two coders then coded the remainder of the year two observations. For the purposes of this report, only the number of minutes teachers and students were engaged in LSC are reported. Time spent in Other Literacy Activities, Non-literacy Activities, and Behavior Management is not disaggregated for this report.

LSC Teacher Interviews. A structured interview was conducted with each LSC teacher after each observation. The interviews were used to gain information to understand the goals of the lesson observed, reconstruct details of the lesson from the LSC teacher's perspective, and enable participants to reflect on the lesson and their training to implement the intervention. Data from the interviews was only used to gain clarity regarding each LSC teacher's implementation of the intervention.

Classroom Implementation Results. Table 1.3 shows the mean percentage of time that LSC teachers spent on the targeted intervention in the Striving Readers classrooms. In year one of the project, fidelity to the LSC model was higher for ninth-grade LSC teachers at 70.4% than for sixth-grade LSC teachers at 58.5%. In year two, implementation increased for both sixth- and ninth-grade LSC teachers to 80.0% and 78.5%, respectively. This represents a large increase in implementation fidelity, for middle school teachers particularly. The LSC trainer indicated that at least 70% of the class time spent on LSC was an adequate level of implementation fidelity. Thus, in year one, ninth-grade LSC teachers achieved an adequate level of implementation fidelity, while both sixth- and ninth-grade LSC teachers achieved adequate levels of implementation fidelity in year two.

Another important aspect of implementation fidelity involves the number of days that students received instruction in the targeted intervention by a trained LSC teacher. As a measure of this variable, the LSC teachers' attendance in the intervention class is presented in Table 1.3. As the table indicates, the average percentage of days attended was 90.5% for sixth-grade LSC teachers, and 91.1% for ninth-grade LSC teachers in year one. In year two, the average percentage of days attended was 78.1% for sixth-grade LSC teachers and 87.5 for

ninth-grade LSC teachers. Thus, it appears that intervention teachers are out of the targeted intervention classroom for a significant percentage of days, which could affect the overall impact of the targeted intervention.

Table 1.3

Mean Implementation of Classroom Model for Targeted Intervention by School as Measured by Percent of Class Time

	Year 1 ^a		Year 2 ^b	
	6 th Grade	9 th Grade	6 th Grade	9 th Grade
LSC Instruction Time: % of class time LSC instruction was observed	58.5%	70.4%	80.0%	78.5%
LSC Instruction Days: % of days LSC teacher was present during school year	90.5%	91.1%	78.1%	87.5%
Number of LSC teachers observed	11	13	12	12

Note. ^aEvery LSC teacher was observed twice in the spring semester of 2007 with the exception of one 9th grade teacher, who was observed once (maternity leave). ^bEvery LSC class was observed in the fall of 2007 and in the spring of 2008. Due to turnover and teacher assignments, 12 6th grade and 12 9th grade teachers were observed.

Implications for Impact Analysis. The level of implementation of the targeted intervention was lower in year one than in year two. The impact on student achievement, however, was greater in year one than in year two (Cantrell, Almasi, Carter, Rintamaa, & Madden, 2008). One possible interpretation of these data suggests that LSC teachers may not need to implement the LSC at a maximum level in order for students to reap its benefits. Instead, it may be that student achievement is maximized when the intervention is implemented at a lower rate. Given that the evaluation is based on only two years worth of data, this interpretation is premature. Thus, it is too soon to be able to suggest solid implications regarding the impact analysis at this point.

Evaluation of the Impacts of the Targeted Intervention: Years One and Two

Study Design

Sampling Plan. The evaluation combines cohorts of sixth and ninth graders from multiple years. In years one and two, sixth- and ninth-graders were randomized to treatment and control. In subsequent years, new cohorts of sixth- and ninth-graders will be randomized to treatment and control. The four cohorts of sixth-graders will be combined for analysis of impacts on sixth-graders, and the four cohorts of ninth-graders will be combined for analysis of impacts on ninth-graders. Thus, the plan is a two-stage sampling design wherein a purposively selected sample of 21 schools was selected in stage one. Stage two sampling occurs each year of the study. In stage two all sixth -and ninth-grade students who meet eligibility criteria of scoring two grade levels below grade level are randomly assigned to treatment and control groups within each of the 21 schools. Students can opt out of the intervention only with a written request by the parent or guardian. School administration strongly encourages treatment for qualified students, however.

Sample Size and Power. After two years of data collection, the study is not yet fully powered for analyses of student achievement. Using Schochet's Model II: Students Clustered Within Schools, the empirical minimal detectable impacts in effect size (MDE) for sixth grade is 0.29 and 0.26 for ninth grade. These calculations are derived assuming a power of .85, 2-tailed test, and $\alpha = .05$. The power is lower for the MARS and MRQ analysis due to smaller sample sizes. At the end of the study, (spring, 2010), the estimated MDE is 0.22 for sixth grade, and 0.19 for ninth grade.

Sample Selection Process: Every sixth- and ninth-grade student in the Striving Readers schools completed the GRADE at the beginning of the fall semester, and every student with an NCE of 33 or lower was assigned to the intervention or control group. Within each school, a stratified random sampling procedure was implemented using four demographic variables: special education status, free/reduced lunch status, ethnicity, and gender. After the initial assignment, the average NCEs were compared for the treatment and control groups. If the difference between treatment and control groups within each school was greater than 2 NCEs, the process was repeated.

Counterfactual. Students who were selected for the control group received a regular elective as part of their freshman program. A wide range of electives were taken, including band, chorus, civics, and physical education.

Missing Data: Case-wise deletion was used for missing data, with the exception of the reading KCCT in the base year (2006). Two schools did not have data that year, so estimates from other years were averaged and substituted.

Data Collection Plan

This impact memo includes data collected the first two years of the study. In the 21 Striving Readers schools, all current sixth- and ninth-graders (with the exception of students who were placed in special education classes all day) were administered the following measures in the fall of 2006 and spring of 2007 (year one), and in the fall of 2007 and spring of 2008 (year two):

Group Reading Assessment and Diagnostic Evaluation (GRADE). In year one, all students took the GRADE assessment (Form A) during the first two weeks of the 2006-2007 school year. Consistent with GRADE norming procedures, the GRADE was administered in classrooms by teachers. Prior to September 1, 2006, schools administered make-up tests to any sixth- or ninth-grader who missed the first administration. In the spring, students took the GRADE assessment (Form B) during the weeks of April 30 – May 11, 2007. In both the fall and the spring, school literacy coaches gathered students' GRADE answer sheets and mailed or delivered them to CCLD offices. Research assistants scanned the answer sheets for scoring. This process for student assessment was repeated in year two (2007-2008).

Student Survey—Metacognitive Awareness of Reading Strategies Inventory (MARSİ)/Motivation to Read Questionnaire (MRQ). The MARSİ (Mokhtari & Reichard, 2002) is a self-report measure designed specifically to assess middle and high school students' perceived use of reading strategies during academic reading. The MARSİ includes items related to three strategy domains: global, problem-solving, and support strategies. The MRQ (Wigfield & Guthrie, 1997) is designed to measure four aspects of motivation for reading (a) self-efficacy (i.e., reading efficacy, reading challenge), (b) intrinsic motivation (i.e., reading curiosity, reading involvement, importance of reading, and reading work avoidance), (c) extrinsic motivation (i.e., competition in reading, recognition for reading, and reading for grades), and (d) social motivation in reading (i.e., social reasons for reading, compliance). Because the MRQ is designed for students in grades three through six, the MRQ was field tested with high school students and was modified.

In year one, students completed the MARSİ/MRQ during the fall and spring of the 2006-2007 school year. Research assistants administered and collected the student surveys during the weeks of September 1 through October 30, in fall and during the weeks of May 14 through June 1 in spring. Because the sample of interest in this evaluation is struggling readers, the research assistants read the survey aloud to students as it was administered. This process for gathering study survey data was repeated in year two (2007-2008).²

²In year one, we observed a large proportion of students who did not complete the student questionnaire (approximately 25%), probably due to the large number of items (82). An Item Response model indicated that the questionnaire could be divided without excessive loss of precision. In the fall of year two, we randomly divided the items into two survey forms of 40 items, and our completion response was higher. In the spring, we included all the MARSİ items and half of the MRQ items for a total of 60 items. An IRT analysis will be used to further refine these results in subsequent years.

Summary of Analytic Approach

Hierarchical Linear Models (HLMs) were used to estimate the impact of the LSC on student achievement, motivation, and reading strategies outcomes. The GRADE Growth Scale Values (GSVs) were used to estimate the impact of the LSC intervention on achievement. The average MARSJ scores were used to estimate the impact on reading strategy use, and the MRQ averages were used to estimate the impact on motivation.

A two-level HLM model (students assigned to intervention or control group within schools) was used to determine the impact of the targeted intervention. At the student level, the spring outcome variable (achievement, strategy use, or motivation) was modeled as a function of fall outcome variables, intervention/control status and four demographic variables: gender, ethnicity, free/reduced lunch status, and special education.

Level-1 Model: Student Outcomes (achievement, reading strategies, or motivation) – Student Level

$$Y_{ij} = \beta_{0j} + \beta_{1j}(Y^*_{ij}) + \beta_{2j}(T_{ij}) + \sum_{m=3}^M \beta_{mj} \alpha_{mij} + \varepsilon_{ij}$$

where

Y_{ij} is the spring student outcome (post-test) score for student i at school j ;

β_{0j} is the mean student outcome (post-test) score for control students at school j ;

Y^*_{ij} is the fall student outcome (pre-test) score for student i centered at school j ;

β_{1j} is the average student outcome (pre-test) slope for students at school j ;

$T_{ij} = 1$ if student i is assigned to LSC intervention at school j , and 0 if control;

β_{2j} is the mean difference of student outcome pre-post gain between intervention and control students at school j ;

α_{mij} are additional covariates representing demographic characteristics of student i at school j (gender, ethnicity, free/reduced lunch, and special education);

β_{mj} are coefficients corresponding to school-level demographic covariates centered at the school j grand mean, and

ε_{ij} is the random effect representing the difference between student ij 's score and the predicted mean score for school j . These residual effects are assumed normally distributed with mean 0 and variance σ^2 .

Level-2 Model: Student Achievement – School Level

This analysis was performed on sixth- grade students and ninth-grade students collected over multiple years. The covariates in this model pertain to the concurrent year the student was in the intervention or control group with the exception of the Reading Kentucky Core Content Test (KCCT) score, for which the score for the base year, 2006, was used. In addition to the base year Reading KCCT score, other school level covariates included the concurrent year school percent of students qualifying for free or reduced lunch fees, concurrent year school percent of

white students in the school, and concurrent year school percent of African American students. With the exception of Title 1 designation, the school level variables were centered at the grand mean for all middle schools (or high schools).

$$\beta_{0j} = \gamma_{00} + \sum_q \gamma_{0q} W_{qj} + \mu_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{mj} = \gamma_{m0}$$

where

γ_{00} is the mean student outcome (post-test) score of 6th grade control students in Kentucky Striving Readers middle schools (note: or 9th grade in high schools);

W_{qj} are 4 school level covariates including base year Reading KCCT (2006), and concurrent year school Title 1 designation, concurrent year school percent free/reduced lunch, concurrent year school percent white students, and concurrent year school percent black students centered at grand mean for all middle schools (or high schools);

γ_{0q} are coefficients corresponding to school-level covariates;

μ_{0j} is the unique effect of school j on mean student outcome, holding W_{qj} constant (or conditioning on W_{qj}) - this effect is assumed normally distributed with mean 0 and variance τ^2 ;

γ_{10} is the average fall student outcome (pre-test) slope;

γ_{20} is the overall target intervention treatment effect on spring student outcome (post-test) scores;

γ_{m0} is the fixed m^{th} school covariate effect on achievement.

Selection of Covariates. Decisions about inclusion of the variables as covariates were made based on a $p < .20$ criterion, with the exception of the LSC intervention variable, which was included regardless of p-value. Of the school-level covariates, either the percent of white students or percent of African-American students was removed at the beginning of the model fitting process (the less significant). Interaction effects were not considered.

Description of the First and Second Year Targeted Intervention Samples

Characteristics of Literacy Coaches

Twenty-four literacy coach positions were filled by 25 teachers in year one and 26 teachers in year two. These literacy coaches implemented the LSC targeted and ALM whole-school interventions within the 21 schools (see Table 1.4). Twelve of the literacy coaches (46%) had a masters degree and 11 (42%) had Rank I (30 hours above masters degree). Literacy coaches had an average of 13.5 years of experience.

Table 1.4

Literacy Coach Demographics

Year	School Level	No. of Literacy Coaches ^{a, b, c}	Gender		Ethnicity		Reading Certification	
			M	F	Caucasian	Asian American	Certified	Not Certified
Year 1	MS	11	0	11	11	0	4	7
	HS	12	1	11	12	0	1	11
	6 – 12	2	0	2	2	0	0	2
	Total	25	1	24	25	0	5	20
Year 2	MS	11	1	10	11	0	4	7
	HS	13	2	11	12	1	1	12
	6 – 12	2	0	2	2	0	0	2
	Total	26	3	23	25	1	5	21

Note. ^aLiteracy Coaches that stayed in the position for less than ½ a semester are not included in these statistics. ^bThere were 25 Literacy Coaches in Year 1 because of turnover at one middle school midyear. ^cThere were 26 Literacy Coaches in Year 2 because of turnover at one middle and one high school midyear.

Characteristics of LSC Classrooms

There were 192 sixth-grade LSC intervention students in year one and 177 LSC students in year two. The average sixth-grade LSC class size was 8.7 students in year one and 8.0 students in year two. There were 250 ninth-grade intervention students in year one, and 211 students in year two. The average ninth-grade LSC class size was 9.6 students in year one and 8.1 students in year two (Table 1.5).

All students were expected to receive a minimum of 50 minutes of intervention instruction daily, or 250 minutes per week. Classes ranged from 45 to 90 minutes in length. For those classes less than 50 minutes an additional class period was added so students averaged at least 250 minutes of intervention instruction weekly. Classes longer than 60 minutes were instructed to use time beyond 60 minutes for other literacy activities. Middle school classes ranged from 50 to 90 minutes daily (250 to 450 minutes weekly). High school classes ranged from 50 to 84 minutes daily (250 to 420 minutes weekly).

Table 1.5

Number of Students in the Targeted Intervention and Control Groups by Year

Grade	Treatment Condition	Year 1	Year 2	Year 1	Year 2
		Number of Students		Mean of Students per Class	
6 th	LSC Intervention	192	177	8.7	8.0
	Control	166	174		
9 th	LSC Intervention	250	211	9.6	8.1
	Control	246	205		
Total	LSC Intervention	442	387		
	Control	412	380		

Characteristics of Students

Among sixth-grade students in years one and two, 369 were intended to be in the intervention and 340 intended for the control group (Table 1.6). We have results for 317 intervention students, including 15 students whose parents opted out of the program. There were 8 intervention students who did not take the spring test and an additional 44 intervention students who transferred or withdrew from school. We have results for 266 control students; 23 control students did not take the spring test and 51 transferred or withdrew from school.

Among ninth-grade students, 461 were intended to be treated and 451 were intended for the control group (Table 1.7). We have results for 365 intervention students, including 30 students whose parents opted out of the program. There were 25 intervention students who did not take the spring test and an additional 71 intervention students who transferred or withdrew from school. We have results for 315 control students; 64 control students did not take the spring test and 73 transferred or withdrew from school.

Table 1.6

Year 1 and Year 2 Actual Number of Students in Evaluation versus Intended Number of Students, Sixth-Grade Intervention and Control Groups

Treatment Condition		Number of Students		
		Year 1	Year 2	Total
Intervention Group	Selected for Treatment and have Spring GRADE scores	168 (11 parent opt-outs)	149 (4 parent opt-outs)	317 (15 parent opt-outs)
	Received Treatment and do not have Spring GRADE scores	6	2	8
	Transferred or withdrew	18	26	44
	Intended Number of Students for Treatment Group, Sixth-Grade Intervention	192	177	369
Control Group	Selected for Control and have Spring GRADE scores	131	135	266
	Selected for Control but do not have Spring GRADE scores	9	14	23
	Transferred or withdrew	26	25	51
	Intended Number of Students for Control Group, Sixth-Grade Control	166	174	340

Table 1.7

Year 1 and Year 2 Actual Number of Students in Evaluation Versus Intended Number of Students, Ninth-Grade Intervention and Control Groups

Treatment Condition		Number of Students		
		Year 1	Year 2	Total
Intervention Group	Selected for Treatment and have Spring GRADE scores	189 (19 parent opt-outs)	176 (11 parent opt-outs)	365 (30 parent opt-outs)
	Received Treatment and do not have Spring GRADE scores	16	9	25
	Transferred or withdrew	45	26	71
	Intended Number of Students for Treatment, Ninth-Grade Intervention	250	211	461
Control Group	Selected for Control and have Spring GRADE scores	163	152	315
	Selected for Control but do not have Spring GRADE scores	37	27	64
	Transferred or withdrew	46	26	72
	Intended Number of Students for Control Group, Ninth-Grade Control	246	205	451

The participation rate for sixth grade for the LSC intervention in the first two years was 317 of the 369 intended students, or 85.9%. The intervention participation rate for ninth grade was 365 of the 461 intended students, or 79.2%. There were no cross over students; no control student was placed in an intervention class. Also, no LSC teacher had an opportunity to teach the LSC curriculum to a control student.

Demographics of students in the intervention and control conditions with outcome data were similar for both sixth and ninth grades in terms of gender, ethnicity, and socioeconomic status. The sample consisted of more males than females (Table 1.8). In terms of ethnicity, nearly 90% of students in the sample were white and approximately 7% of the students were African American for years one and two.

Table 1.8

Year 1 and Year 2 Intervention and Control Student Demographics (and Proportions)

Grade	Treatment	Gender		Ethnicity		Lunch		Special Education		
		Male	Female	White	Minority	Pays	Free/Reduced	Not In	Rdg/Wrtg	LEP, EBD, Comb
6th	Intervention	182 (.57)	135 (.43)	278 (.88)	39 (.12)	98 (.31)	217 (.69)	217 (.69)	66 (.21)	34 (.11)
	Control	154 (.58)	112 (.42)	224 (.84)	42 (.16)	92 (.35)	174 (.65)	197 (.74)	44 (.17)	24 (.09)
9th	Intervention	213 (.58)	152 (.42)	323 (.89)	42 (.12)	143 (.39)	222 (.61)	248 (.68)	73 (.20)	43 (.12)
	Control	174 (.55)	141 (.45)	276 (.88)	39 (.12)	123 (.39)	191 (.61)	240 (.76)	43 (.14)	32 (.10)
Totals		723 (.57)	540 (.43)	1101 (.87)	162 (.13)	456 (.36)	804 (.64)	902 (.72)	226 (.18)	133 (.11)

Tests of Equivalence of Treatment and Comparison Students

Table 1.9 displays the results of independent samples *t*-tests in which the null hypothesis that sixth-grade intervention students' pretest scores did not differ significantly from sixth-grade control students' pretest scores on the GRADE measure was evaluated. Results confirmed the null hypothesis that sixth-grade students in the intervention and control conditions were equivalent at the time of the pretest on the GRADE in terms of Growth Scale Value (GSV), $t_{(581)} = -0.319$, $p \leq 0.750$ (two-tailed).

Table 1.9 also displays the results of independent samples *t*-tests in which the null hypothesis that ninth-grade intervention students' pretest scores did not differ significantly from ninth-grade control students' pretest scores on the GRADE measure was evaluated. Results confirmed the null hypothesis that ninth-grade students in the intervention and control conditions were equivalent at the time of the pretest on the GRADE in terms of Growth Scale Value (GSV), $t_{(675)} = -0.607$, $p \leq 0.542$ (two-tailed).

Table 1.9

Equivalence of Groups on GRADE Pretest 2007 and 2008

Grade	Treatment Condition	<i>n</i>	Mean	Standard Deviation	<i>t</i>	<i>df</i>	<i>p</i>
6 th	Intervention	317	423.86	11.47	-0.319	581	0.750
	Control	266	424.17	12.27			
9 th	Intervention	365	450.30	9.54	-0.607	675	0.542
	Control	315	450.76	10.22			

The null hypothesis that sixth-grade intervention students' pretest scores did not differ significantly from sixth-grade control students pretest scores on the MARSI was also evaluated (Table 1.10). Results showed that sixth graders in the intervention and control conditions were equivalent at the time of the pretest in terms of their reported strategy use for the full scale, $t(399) = -1.646, p \leq 0.101$ (two-tailed). The null hypothesis that ninth-grade intervention students' pretest scores did not differ significantly from ninth-grade control students pretest scores on the MARSI was also evaluated (Table 1.10). Results showed that ninth graders in the intervention and control conditions did not differ significantly at the time of the pretest, $t(412) = 0.539, p \leq 0.590$ (two-tailed).

Table 1.10

Equivalence of Groups on MARSJ Pretest 2006 and 2007⁴

Grade	Treatment Condition	<i>n</i>	Mean	Standard Deviation	<i>t</i>	<i>df</i>	<i>p</i>
6 th	Intervention	217	2.99	0.675	-1.646	399	0.101
	Control	184	3.10	0.661			
9 th	Intervention	214	2.65	0.731	0.539	412	0.590
	Control	200	2.62	0.652			

Table 1.11 displays the results of independent samples *t*-tests in which the null hypothesis that sixth-grade intervention students' pretest scores did not differ significantly from sixth-grade control students' pretest scores on the MRQ measure was also evaluated. Results confirmed the null hypothesis that sixth-grade students in the intervention and control conditions were equivalent at the time of the pretest on the MRQ full scale, $t(399) = -0.433$, $p \leq 0.658$ (two-tailed).

The null hypothesis that ninth-grade intervention students' pretest scores did not differ significantly from ninth-grade control students pretest scores on the MRQ was also evaluated (Table 1.11). Results showed that ninth-graders in the intervention and control conditions did not differ significantly at the time of the pretest, $t(412) = -0.991$, $p \leq 0.363$ (two-tailed).

⁴ There are fewer students that completed the MARSJ than completed the GRADE because it was administered on different days, by different people in a different context. Also in year one the questionnaire was lengthy and was reduced the following year.

Table 1.11

Equivalence of Groups on MRQ Pretest, 2006 and 2007⁵

Grade	Treatment Condition	<i>n</i>	Mean	Standard Deviation	<i>t</i>	<i>df</i>	<i>p</i>
6 th	Intervention	217	2.82	0.462	-0.443	399	0.658
	Control	184	2.84	0.450			
9 th	Intervention	214	2.45	0.470	-0.991	412	0.363
	Control	200	2.49	0.6440			

Change in Literacy Coaches' Efficacy at the End of Two Years

The Teacher Efficacy Survey was used to determine changes in Literacy Coaches' efficacy for literacy teaching over the course of two years.

Teacher Efficacy Survey. Teachers' sense of efficacy for teaching has been associated with effective classroom practices (Ashton & Webb, 1986; Gibson & Dembo, 1984) and higher student achievement (Ross, 1992). Pre- and post-surveys of teacher efficacy were used to determine the effects of the project on teachers' sense of efficacy for literacy teaching. A teacher efficacy survey comprised of sixty items to measure Personal Teaching Efficacy (PTE) and Collective Teacher Efficacy (CTE) was administered to literacy coaches. PTE items were drawn from teacher efficacy instruments developed by Woolfolk and Hoy (1990), Hoy and Woolfolk (1993), and Gibson and Dembo (1984). PTE items include statements, such as, "Some students are not going to make a lot of progress this year in reading, no matter what I do." CTE items were developed by Goddard, Hoy, and Hoy (2000) and include statements, such as, "If a child does not want to read in their content area, most teachers in my school give up." Some questions from the original surveys were altered to reflect more of a reading emphasis (e.g., "When a student does better than usual in reading, it is often because I exerted a little extra effort.") while some additional questions were added by the evaluation team that focused specifically on processes related to teaching content area literacy, such as, "I know how to teach vocabulary effectively." All items used a 6-point Likert-type format, ranging from 1 is equal to Strongly Agree to 6 is equal to Strongly Disagree.

All of the original instruments from which the present survey was adapted have demonstrated high reliability and validity. Gibson and Dembo (1984) reported Cronbach's alpha

⁵ There are fewer students that completed the MRQ than completed the GRADE because it was administered on different days, by different people in a different context. Also in year one the questionnaire was lengthy and was reduced the following year.

coefficient of 0.75 on the PTE subscales. Goddard et al. (2000) reported Cronbach's alpha coefficient of 0.96 for the CTE subscale. In the present study the reliability of each subscale, with the revisions described above, was evaluated using the entire teacher sample (literacy coaches and content teachers). The Personal Teaching Efficacy (PTE) subscale in the summer of 2006 ($\alpha = 0.878$, $n = 624$) and in the summer of 2007 ($\alpha = 0.912$, $n = 609$) was reliable. Likewise, the Collective Teacher Efficacy (CTE) subscale in the summer of 2006 ($\alpha = 0.801$, $n = 650$) and the summer of 2007 ($\alpha = 0.833$, $n = 647$) was reliable. In the summer of 2008, the reliability remained high for PTE ($\alpha = .899$, $n = 602$) and for CTE ($\alpha = 0.829$, $n = 643$).

Teacher Efficacy Results

The literacy coaches' self efficacy was measured using the Teacher Efficacy Survey. Pre-test data were gathered prior to training in the summer of 2006. Literacy coaches' efficacy was measured again in the summer of 2008. Table 1.12 displays the means and standard deviations for literacy coaches on the Personal Efficacy and Collective Efficacy Subscales.

Table 1.12

Literacy Coach Teacher Efficacy Statistics, Summer 2006 and Summer 2008

	Summer	No. of Literacy Coaches Completing Survey	Min.	Max.	Mean/ (Std. Dev.)
Personal Efficacy	2006	16	3.44	5.19	4.43 (.567)
	2008	16	3.91	5.30	4.61 (.483)
Collective Efficacy	2006	16	3.06	4.78	3.96 (.490)
	2008	16	2.72	5.11	3.92 (.600)

Note. Sixteen Literacy Coaches completed the survey in both 2006 and 2008.

Impacts on Students at the End of Two Years

Measures of Student Outcomes

Group Reading Assessment and Diagnostic Evaluation (GRADE). The GRADE is a norm-referenced, standardized test of reading achievement which yields standard Normal Curve Equivalent (NCE) scores and scale scores labeled Growth Scale Value (GSV) scores. GSVs are a

measure of reading progress on a scale that can be followed over a period of years and across grade levels. GSVs form an equal-interval scale which can be arithmetically manipulated and represents continuous growth in reading from primary through high school. GSVs were created by linking GRADE scores from grades 1 through 12, and using the Rasch model to create the w-ability scale scores. For example, a GSV of 463 represents an average beginning sixth-grade performance, and a GSV of 488 represents an average beginning ninth-grade performance.

Fugate and Waterman (2004) found the GRADE's reliability adequate for educational decision making. Internal reliability coefficient alphas and split-half reliabilities are consistently high (alphas above 0.90) across test levels, forms and grade-enrollment group. Alternate forms reliability ranged from 0.81 to 0.93, while test-retest reliability coefficients ranged from 0.88 to 0.93 indicating stability of GRADE total test scores. The reliability of the GRADE as presented by the GRADE Technical Manual (Chapter 4) indicates consistency in test scores.

Metacognitive Awareness of Reading Strategies Inventory (MARSİ). The (MARSİ) is a self-report measure designed specifically to assess middle and high school students' perceived use of reading strategies during academic reading (Mokhtari & Reichard, 2002). The MARSİ includes items related to three strategy domains: Global, Problem-Solving, and Support Strategies. Global Reading Strategies represent a set of reading strategies oriented toward a global analysis of text. Problem-Solving Strategies include items oriented around strategies for solving problems when the text becomes difficult to read. Support Reading Strategies involve use of outside reference materials, taking notes, and other functional or support strategies. The survey items are presented on a scale of 1 to 5, where 1 is equal to "I never or almost never do this" and 5 is equal to "I always or almost always do this." This measure has been reported to have high reliability. Mokhtari and Reichard reported a Cronbach's alpha coefficient of 0.93 for the entire scale. In the first year of this study, we found a Cronbach's alpha coefficient for fall and spring of 0.92 and 0.93 (930 items), respectively, for the MARSİ.

Motivation to Read Questionnaire (MRQ). A modified MRQ (Wigfield & Guthrie, 1997) was used to measure motivation for reading. Items relate to aspects of motivation such as self-efficacy, intrinsic motivation, extrinsic motivation, and social motivation in reading. The MRQ consists of 55 items and uses a 4-point Likert response scale. The MRQ was normed for students through grade six, so the measure was field tested and modified for grades six through twelve. In year one, we used the full MRQ scale. The MRQ had a Cronbach's alpha of 0.93 in the fall and spring (50 items).

Impacts on Student Reading Achievement

Sixth Grade. Table 1.13 indicates the overall impact of the targeted intervention on student achievement after two years. For the sixth-grade spring GRADE GSVs, the unadjusted means for the treatment and control groups are 441.7 and 440.8, respectively. However, the estimate of the HLM-adjusted means for spring GSVs is 437.9 for treatment and 436.0 for

control. This indicates no significant differences in spring GSVs for treatment and control ($ES=0.095$, $p = .172$).

Appendix C (Exhibit Table 1) shows a summary of model results when significant variables were used as covariates. The estimate of the spring GSV was 430.51 for students with the following characteristics: (a) the school had the average percent free and reduced lunch students for the concurrent year, of the middle schools in the sample, and (b) the student was in the control group, was in special education for reasons other than reading and writing disability, and had a GRADE GSV at his or her school's average. The estimate decreases by 0.3886 for every percent increase from the average middle school percent of students receiving free or reduced lunches. For every point above the school average fall GSV score, the estimate increases by 0.6650. If a student was in the intervention, the estimate increases by 1.9252. If a student was not in special education, the estimate increases by 11.3707, and if the student was in special education due to a reading and writing disability, the estimate increases by 1.2062. There is very little explained variance in student achievement due to the effect of the school, with an intra-class correlation (ICC) of 0.0679.

Ninth Grade. Table 1.13 shows the overall impact of the targeted intervention on ninth-graders' reading achievement. For ninth-grade spring GRADE GSVs, the unadjusted means for the treatment and control groups are 466.2 and 465.0, respectively. However, the estimate of the HLM-adjusted means for spring GSVs is 462.8 for treatment and 460.9 for control. This indicates no significant differences in spring GSVs for treatment and control ($ES=.106$, $p=0.137$).

Appendix C (Exhibit Table 2) shows a summary of the model results for ninth grade when significant variables were used as covariates. The estimate of the spring GSV was 456.31 if the student had the following characteristics: (a) the school's reading KCCT at base year (2006) was average for the high schools in the sample, and (b) the student's school had the average percentage of free and reduced lunch for high schools our sample, and (c) the student was in the control group, was a minority student, was in special education for reasons other than reading and writing disability, and had a GRADE GSV at his/her school's average. The estimate increases by -0.2245 for every unit increase in the base year reading KCCT score above the high school average, and decreases by 0.2930 for each increase in the school's percentage of students receiving free and reduced lunch during the intervention year. If a student was in the intervention, the estimate increases by 1.8941. If a student was white, the estimate increases by 5.1363. If a student was not in special education, the estimate increases by 4.8684, and if the student was in special education for a reading and writing disability, the estimate increases by 0.261. There is virtually no explained variance in student achievement due to the school, with an intra-class correlation (ICC) of 0.0037.

Table 1.13

Overall Impact of the Target Intervention on Student Achievement, Spring 2008

	Unadjusted Means		HLM-adjusted Means		Estimated Impact	Effect Size	<i>p</i>
	Control	Tx	Control	Tx			
6 th Grade Spring GSV	440.8 (20.18)	441.7 (20.46)	436.0	437.9	1.93	0.095	0.172
6 th -Grade Students	266	317					
No. of Schools = 12							
9 th Grade Spring GSV	465.0 (17.75)	466.2 (18.44)	460.9	462.8	1.89	0.106	0.137
9 th -Grade Students	315	365					
No. of Schools = 12							

Note. Standard deviations are presented in parenthesis.

Impacts on Students' Reading Strategy Use

Sixth Grade. Table 1.14 indicates the impact of the LSC intervention on sixth-grade students' strategy use, overall. The unadjusted means for the full MARS scale for treatment and control were 2.97 and 2.85, respectively. The HLM-adjusted means were 3.06 for the treatment group and 2.90 for the control group, and this difference between treatment and control was significant ($ES = 0.219$, $p = 0.017$).

Appendix C (Exhibit Table 3) shows a summary of the model results for the full MARS scale when significant variables were used as covariates. As this table indicates, if (a) the student attended a middle school having the average KCCT reading scores at the base year (2006) for the middle schools in the sample, (b) the school percent free and reduced lunch (concurrent year) was average for middle schools, (c) the school percent of students in special education (concurrent year) was the average percent for middle schools, (d) the school percent of African-American students was the average percent for middle schools, and (e) the school had the average fall MARS score, was in the control group and was female then the estimated spring MARS score was 3.117. The estimate increases by 0.018 for every point a school is above the average middle school base year KCCT reading score, increases by 0.015 for every percent of students receiving free and reduced lunch, increases by .048 for every percent of disabled students at the school, and decreases by 0.031 for every percent of African American students at the school. The estimate increases by 0.359 for each unit the student scored above the

average fall MARSİ score at his/her school. If the student was in the intervention, the estimate increases by 0.154, and if the student was male, the estimate decreases by 0.144. The model yielded an intra-class correlation of 0.031 for reading strategy use, indicating very little variance explained by a school effect.

Ninth Grade. Table 1.14 indicates the impact of the targeted intervention on ninth-grade students' reading strategy use overall. The unadjusted means for the full MARSİ scale for treatment and control were 2.68 and 2.58, respectively. The HLM-adjusted means were 2.76 for the treatment group and 2.67 for the control group, however this difference between treatment and control was not significant ($ES = 0.115$, $p = 0.203$).

Appendix C (Exhibit Table 4) shows a summary of model results when significant variables were used as covariates. This table indicates, if (a) the student attended a middle school having the average KCCT reading scores at the base year (2006) for the high schools in the sample, (b) the school percent of students in special education was average, (c) the school percent of white students was average, and (d) the school had the average fall MARSİ score, was in the control group, was female, and was white, then the estimate of the spring MARSİ score was 2.94. The estimate increases by 0.029 for every unit increase the school's reading KCCT was higher than the high school average in the base year (2006), increases by 0.064 for every percent of students in special education greater than the high school average, and increases by 0.017 for every percent of white students at the school. For every percent greater than the school average a student scored on the fall MARSİ, the estimate increased by 0.395. If the student was in the intervention, the estimate increases by 0.085. If the student was male, the estimate decreases by 0.151, and if the student was white, the estimate decreases by 0.283. The model yielded an intra-class correlation of 0.017 for ninth-grade student strategy use, indicating that very few of the spring scores were explained by the school.

Table 1.14

Overall Impact of the Target Intervention on Reading Strategy Use, Spring 2008

	Unadjusted Means		HLM-adjusted Means		Estimated Impact	Effect Size	<i>p</i>
	Control	Tx	Control	Tx			
6 th Grade Spring GSV	2.85 (0.702)	2.97 (0.691)	2.90	3.06	0.154	0.219	0.017
6 th -Grade Students	177	215					
No. of Schools = 12							
9 th Grade Spring GSV	2.58 (0.738)	2.68 (0.745)	2.67	2.76	0.085	0.115	0.203
9 th -Grade Students	193	211					
No. of Schools = 11							

Note. Standard deviations are presented in parenthesis.

Impacts on Student Motivation

Sixth Grade. Table 1.15 indicates the overall impact of the targeted intervention on sixth-grade students' reading motivation as measured by the MRQ. To assess the impact of the targeted intervention on students' motivation, we used HLM analysis on the full MRQ scale. For sixth grade, the MRQ unadjusted means for treatment and control was 2.77 and 2.66 respectively. The HLM-adjusted means for treatment and control groups were 2.76 for treatment and 2.65 for control, with an estimated impact of 0.140. This difference between the treatment and control groups was significant ($ES = 0.229$, $p < .01$).

Appendix C (Exhibit Table 5) shows a summary of model results for sixth-grade students' reading motivation when significant variables were used as covariates. The estimate of spring MRQ score was 2.721 for a student who was in the control group, received free and reduced lunch, responded with an average MRQ for his/her school in the fall, and was in a school with the following characteristics: (a) average KCCT reading score at the base year (2006), (b) average percentage of students receiving free and reduced lunch, (c) average percentage of students who were receiving special education, and (d) average percent of African American students. The estimate increases by 0.010 for each school-level percent increase in students receiving free and reduced lunch and by 0.034 for each school-level percent increase in students in special education. The estimate decreases by 0.013 for each school-level percent increase in African American students. The estimate increases by 0.368 for every unit the

student scored above the school average on the fall MRQ. If the student was in the intervention group, the estimate increases by 0.108, and if the student did not receive free and reduced lunch, the estimate decreases by 0.064. Very little variance in the spring MRQ scores are explained by the school, with an intra-class correlation = 0.068.

Ninth Grade. Table 1.15 shows the impact of the LSC targeted intervention on students' reading motivation as measured by the MRQ. The unadjusted means for the full scale MRQ in the spring are 2.46 and 2.36 for treatment and control, respectively. The HLM-adjusted mean for the treatment group is 2.48 and for the control group is 2.35, with an estimated impact of 0.122. This indicates a significant difference between the treatment and control groups' mean spring scores ($ES = 0.231$, $p < .01$).

Appendix C (Exhibit Table 6) shows a summary of model results for ninth-grade students' reading motivation. The estimate of spring MRQ scores was 2.36 for a student who was in a school with a reading KCCT score at base year (2006) that was average for high schools and had the average fall MRQ score, and who had the following individual characteristics: (a) in the control group, (b) female, (c) was a minority student, and (D) with a fall MRQ score that was average for his/her high school. For every unit the student's fall MRQ score is higher than average, the estimate increases by 0.520. If the student was in the intervention group, the estimate increases by 0.112. If the student is male, the estimate decreases by 0.093, and if the student is white, the estimate decreases by 0.170. The model yielded an ICC of 0.033 for reading motivation, indicating that very little variance in the MRQ score is explained by school.

Table 1.15

Overall Impact of the Target Intervention on Student Motivation, Spring 2008

	Unadjusted Means		HLM-adjusted Means		Estimated Impact	Effect Size	<i>p</i>
	Control	Tx	Control	Tx			
6 th Grade Spring MRQ Score	2.66 (0.470)	2.77 (0.460)	2.65	2.76	0.108	0.229	0.011
6 th -Grade Students	177	215					
No. of Schools = 12							
9 th Grade Spring MRQ Score	2.36 (0.529)	2.46 (0.510)	2.35	2.48	0.122	0.231	0.006
9 th -Grade Students	193	211					
No. of Schools = 11							

Evaluation of the Implementation of the Whole-School Intervention: Years One and Two

Exhibit 4A shows the research questions that guided the implementation study of the whole-school intervention in years one and two. Exhibit 4B indicates the data sources that were used to answer each question.

Exhibit 4A.

Research Questions on the Implementation Study of the Whole-School Intervention in Years 1 and 2

What was the level of implementation of professional development/support for teachers/coaches/leaders in Year 1 and 2?

Professional Development for Teachers

What type and amount of professional development was provided to teachers and what was the average level of participation?

What type and amount of professional development was provided to district leaders and what was the average level of participation?

Professional Development/Support for Coaches/Other Relevant Staff

What type and amount of professional development was provided to literacy coaches and what was the average level of participation?

What type and amount of coaching was provided to coaches and what was the average level of participation?

What was the level of implementation of classroom instruction in Year 1 and 2?

What percentage of class time did teachers use the whole-school instructional practices?

*Exhibit 4B.**Year 1 and 2 Data Sources on Implementation Linked with Research Questions: School-Wide Intervention (CTL Adolescent Literacy Model)*

Research Questions	Measures/Data Sources					
	Responsible Partner				Record Review	
	Developer of ALM model (CTL)	U of L trainer/Coordinator	Project Director	Evaluator	PD attendance records	Surveys/Questionnaires/Logs/Classroom Observations
What was the level of implementation of professional development support/participation for teachers in Year 1?						
What type and amount of professional development was provided to teachers and what was the average level of participation?	●				●	
What type and amount of professional development was provided to district leaders and what was the average level of participation?	●		●		●	
What was the level of implementation of professional development/support for literacy coaches/leaders in Year 1?						
What type and amount of professional development was provided to ALM coaches and what was the average level of participation?	●	●			●	●
What type and amount of coaching was provided to ALM coaches and what was the average level of participation?	●				●	●
What was the level of implementation of classroom instruction in Year 1?						
What was the percentage of class time that teachers used the whole-school instructional practices?				●		

Whole-School Professional Development Inputs

Table 2.1a shows the participation of content teachers in the ALM whole school professional development inputs, and Table 2.1b shows the participation of the ALM coaches and administrators. In years one and two, the percentage of content teachers who attended at least one day of the whole-school summer training was calculated. In year one, the average percentages of middle, high, and 6 - 12 teachers who attended the summer training were 86.1%, 83.8%, and 100% respectively. In year two, the average percentages of middle, high, and 6 - 12 teachers who attended the summer training were 84.5%, 80.9%, and 78.0%, respectively. This represents a decrease in content teachers' participation from year one to year two. The CTL trainer indicated that at least 80% participation was adequate, therefore all categories of teachers were adequate in year one, overall. In year two, middle and high school teachers had adequate participation, and 6 - 12 teachers had nearly adequate participation.

Table 2.1a

ALM Implementation of Professional Development for Content Teachers

PD Input	PD Received	Year 1			Year 2		
		MS	HS	Grades 6 – 12	MS	HS	Grades 6 – 12
ALM PD for content teachers	No. of certified content teachers attending at least 1 PD day	329	409	42	330	448	39
	% of content teachers attending PD	86.1%	83.8%	100.0%	84.5%	80.9%	78.0%

Note. In Year 1, teachers participated in 5 days of professional development. In Year 2, teachers participated in 2 days of professional development.

School administrators were expected to attend training sessions on the ALM school-wide model in both years one and two. As is indicated in Table 2.1b, 2 days of professional development was provided in year one. Middle and high school administrators attended an average of 1.7 days, and administrators in 6 – 12 schools attended an average of 1.8 days. In year two, 1.5 days of professional development was provided. The average attendance for middle and high school administrators was 1.3, and the average attendance for administrators of grades 6 - 12 schools was 1.5 days. Administrators were also expected to attend the school-wide trainings with their content teachers. In year one, 21 administrators from 12 schools attended at least one day. In year two, 16 administrators from 12 schools attended at least one day.

In years one and two, ALM coaches were expected to attend training sessions to learn about how to support the ALM whole-school model. In year one, middle, high, and 6 – 12 ALM coaches attended an average of 11.1, 10.6, and 12.0 days, respectively. According to the school-wide professional development director, attending at least 8 days was an adequate level of participation, so the average level of participation was adequate for all categories. In year two, middle, high, and 6 - 12 ALM coaches attended an average of 9.0, 9.1, and 9.5 days of training, respectively. The adequacy level of participation for year two was identified as at least seven days attendance, so again, participation in all categories was adequate, overall.

In addition to these training sessions, mentor coaches from CTL provided on-site support to ALM coaches. In year one, the average number of days of support from mentor coaches (for a six hour day) for middle, high, and 6 - 12 ALM coaches was 5.4, 6.4, and 6.4, respectively. In year two, the average number of days of support from mentor coaches for middle, high, and 6 - 12 ALM coaches was 5.6, 6.1, and 6.0, respectively. The professional development director indicated that at least 4 days represented adequate support for both years, so it appears the support received was adequate overall. In addition to support in the form of school visits, mentor coaches provided support for ALM coaches as needed, through phone calls, emails, and electronic distance support. This support was for both the targeted intervention and whole-school intervention, and while documentation of this support was provided, it was not designated the extent to which the support was specific to the targeted intervention or whole-school model. Overall, ALM coaches and mentor coaches engaged in 10,461 minutes of phone support calls, exchanged 2,410 emails, and participated 357 times in formal distance support.

Many literacy coaches completed hallmark assignments as part of their certification program through University of Louisville. There was one school-wide hallmark assignment in year one and two in year two. Literacy coaches had to earn a B- or better on an assignment for it to be adequately completed. In year one, 90% of middle school literacy coaches completed assignments adequately, and in year two 40% completed them adequately. Sixty-seven percent of high school literacy coaches completed the year one assignments adequately, and 33% did so in year two. One hundred percent of 6 - 12 school literacy coaches completed assignments adequately in both years one and two.

Table 2.1b

ALM Implementation of Professional Development for Administrators and ALM Coaches

PD Input	PD Received	Year 1			Year 2		
		MS	HS	Grades 6 – 12	MS	HS	Grades 6 – 12
ALM PD for administrators ^a : Year 1, 2 days of PD Year 2, 1.5 days of PD	Av. no. of days administrators attended PD	1.7 (1 to 2)	1.7 (0.5 to 2)	1.8 (1.5 to 2)	1.3 (1 to 1.5)	1.3 (1 to 1.5)	1.5
	No. of administrators	10	9	2	10	9	2
ALM PD for ALM coaches: Year 1, 12 days of PD Year 2, 9.5 days of PD	Av. no. of days ALM coaches attended PD	11.1 (8 to 12)	10.6 (7 to 12)	12.0	9.0 (8.5 to 9.5)	9.1 (7.5 to 9.5)	9.5
	No. of ALM coaches	10	12	2	10	12	2
Mentor Coaching	Av. no. of site visit days	5.4 (4.2 to 7.5)	6.4 (2.5 to 12)	6.4 (5.3 to 7.5)	5.6 (3 to 8)	5.1 (3 to 8)	6.0 (5 to 7)

Note. ^aAdministrators were encouraged to also attend the ALM PD intended for content teachers, in year 1, 21 administrators from 12 schools attended at least one day. In year 2, 16 administrators from 12 schools attended at least one day.

Classroom Observations. In the summer of 2006, research assistants attended a training session conducted by CTL trainers. Research assistants attended the same school-wide intervention training sessions as the content area teachers. Following that training, the research assistants and investigators worked collaboratively to create an observation protocol. First, they listed the six instructional domains present in the school-wide intervention (fluency, comprehension, writing to use what you know, writing to learn, academic dialogue, vocabulary development). Second, they identified activities associated with each component. This section of the observation protocol provided evidence as to whether any of the six instruction domains were present during content area instruction. Interview questions were constructed to supplement observations. The investigators then constructed the observation protocol and sent it to the Professional Development Director at CTL for feedback. Codes were developed to characterize the range of instructional behaviors observed in the intervention classrooms.

The investigators then met with the research assistants to provide training related to taking field notes. Training consisted of lecture related to taking field notes, watching video segments, practice taking field notes, and critique. Research assistants were trained to organize

their field notes in five-minute time intervals, capturing as much detail about instruction and classroom dialogue as was possible. Sample field notes were shared, critiqued, and refined.

In November of 2006 research assistants went out in pairs and practiced taking field notes in three intervention classrooms. In December of 2006 the group reconvened and research assistants practiced coding the data and discussing the codes after each observation was coded. Each five-minute segment was coded using codes to represent (a) the ALM domains (fluency, comprehension, writing to use what you know/writing to learn, vocabulary development, and academic dialogue) and, (b) Other Literacy Activities, (c) Non-literacy Activities, or (d) Behavior Management Activities. Agreement was discussed but not compiled/computed at this meeting.

During the spring of 2007 all English/Language Arts (E/LA) content area teachers were observed for one class period on two different occasions ($n = 78$ total observations). Research assistants completed field notes, interviewed the content area teacher, and completed a protocol each time they observed. The purpose of these observations was to determine the extent to which content area classroom teachers implemented aspects of the school-wide intervention in their instruction. Observers sought and recorded evidence from the classroom environment, the observation, and an interview with the teacher. At the end of the observation the number of minutes spent engaged in the Adolescent Literacy Model Activities, Other Literacy Activities, Non-literacy Activities, and Behavior Management Activities was recorded. In this report, just the percentage of time that teachers implemented strategies in the ALM domains, overall, is reported.

Three members of the evaluation team sought inter-rater reliability for coding the observation protocols. First, two co-principal investigators coded and discussed one protocol. They used that coding event to establish initial rules for coding. Second, they coded five protocols independently. They discussed those five coded protocols and refined the coding rules further. Third, they recoded the initial five protocols using the new rules. Next, they coded an additional five protocols using the new rules. Inter-rater agreement on all 10 protocols (13% of the data) was 92%. Agreement on the last five protocols was 82%. After inter-rater agreement was established, raters discussed and came to 100% consensus on all codes.

The co-principal investigators used three of the coded protocols and three additional protocols to train two advanced doctoral students in literacy to use the coding rules. The co-principal investigator coded eight additional protocols (four each) and both doctoral students coded all eight protocols. Inter-rater agreement between the two doctoral students and each of the co-principal investigators was 83.1% and 89.8% respectively. Overall inter-rater agreement across all raters was 85.5%.

During the 2007-2008 academic year, all sixth- and ninth-grade Language Arts teachers were again observed twice, once in the fall and once in the spring ($n = 101$). Additionally, two middle schools and two high schools were randomly selected for additional observations in math, science and social studies classrooms ($n = 49$). Those content teachers were also observed twice, once in the fall and again in the spring.

Teacher Interviews. A structured interview was conducted with each classroom teacher after each observation. The interviews were used to gain information to understand the goals of the lesson observed, reconstruct details of the lesson from the teacher's perspective, and enable participants to reflect on the lesson and their training to implement the school-wide intervention. Data from the interviews was only used to gain clarity regarding each teacher's implementation of the intervention.

Classroom Implementation Results. Table 2.2 shows the mean percentages of content class time that content-area teachers implemented the ALM whole-school intervention techniques. In year one, the middle, high, and 6 - 12 E/LA teachers spent 27.7%, 24.5%, and 13.0% of their class time using the whole-school intervention techniques, respectively overall. In year two, the table indicates that use of the whole-school intervention techniques decreased among high school E/LA teachers, stayed about the same among middle school E/LA teachers but increased among E/LA teachers in 6 - 12 schools. In year two, a sample of teachers in other content areas in middle and high schools were observed in addition to all E/LA teachers. Overall, middle school teachers in other content areas used the whole-school techniques for a larger percentage of time (36.6%) than did middle school teachers of E/LA (27.1%). In high schools, however, the converse was true, with E/LA teachers using the whole-school techniques for a larger percentage of time (13.7%) than teachers in other content areas (9.9%). It is interesting that, for both years one and two, middle school teachers exhibited higher levels of implementation than high school teachers, overall. The ALM school-wide intervention trainer indicated that at least 30% of content-area teachers' class time should be spent on the school-wide techniques, and this level of implementation was achieved by other content-area teachers in year two.

Table 2.2

Mean Percentage of Time Content Teachers Implemented Whole-School Model in Classroom

			MS	HS	Grades 6-12
Year 1 ^a	LA/English teachers	% of class time ALM was observed	27.7%	24.5%	13.0%
		Number of teachers observed	23	21	4
		Number of observations	39	33	6
	LA/English teachers	% of class time ALM was observed	27.1%	13.7%	27.8%
		Number of teachers observed	25	23	4
		Number of observations	50	45	6
Year 2 ^b	Other content area teachers	% of class time ALM was observed	36.6%	9.9%	N/A
		Number of teachers observed	13	12	
		Number of observations	25	24	

Note. ^aTeachers were observed in the spring semester of 2007. ^bTeachers were observed in the fall of 2007 and again in the spring of 2008.

Evaluation of the Impacts of the Whole-School Intervention: Years One and Two

Description of the First and Second Year Samples

Approximately one thousand seventy-five content area classroom teachers were trained to implement the school-wide intervention during the summers of 2006, 2007 and 2008 in Striving Readers schools. Five hundred-twenty five teachers completed the Teacher Efficacy Survey in the summer of 2006, 738 teachers in 2007, and 610 teachers in 2008. In addition, a matched comparison school was identified for each Striving Readers school. These matched pairs were identified by the Kentucky Department of Education based on ethnicity, number of students, percent free and reduced lunch, and accountability index. Of the twenty-one matched schools, 11 agreed to participate as a comparison school in year one. In year two, eight schools agreed to administer the Teacher Efficacy Survey to all content area teachers in their building. Four hundred-fifty content teachers in matched schools completed the survey from which demographic data were gathered. Three hundred-twenty-one content area teachers in the matched schools completed the survey in 2006, 207 teachers in 2007, and 204 teachers in 2008.

Demographic data were gathered from the Teacher Efficacy Survey (Table 2.3). Large proportions of teachers in both Striving Readers and matched schools did not complete the demographic portions of the survey in 2006 and 2007. That number decreased significantly in 2008 when improvements were made to the survey.

Table 2.3

Striving Reader and Matched Schools Teacher Demographics

Tx.	No. of teachers	Gender		Ethnicity			Highest Degree Earned				
		F	M	Cauc/ No Resp.	Af. Am.	Other	BA/ BS	MA/ MS	Doc- torate	Specialist	No Resp.
SR	1075	699	378	1032	22	21	226	635	5	150	51
2006- 2008		(.65)	(.35)	(.96)	(.02)	(.02)	(.21)	(.59)	(.01)	(.14)	(.04)
Match	450	288	263	418	17	15	75	266	3	90	14
2006- 2008		(.64)	(.36)	(.95)	(.03)	(.02)	(.17)	(.59)	(.01)	(.20)	(.03)

The mean number of years of experience for content area teachers in Striving Readers schools was 12.2 years. Years of experience ranged from 0 to 39 years. The mean years of experience for teachers in the matched schools was similar (12.8 years) and ranged from 0 to 47 years. The corresponding pie charts (Figure 1.1) show content areas were represented with similar proportions of teachers in the Striving Readers and matched schools across both years. Teachers' primary teaching responsibility in terms of grade level also had similar proportions in Striving Readers and matched schools with the exception of sixth and ninth grades. Striving Readers schools had a larger proportion of sixth-grade teachers, and a smaller proportion of ninth-grade teachers complete the questionnaire as compared to the matched schools (Figure 1.2).

Figure 1.1

Striving Reader and Matched School Teachers' Primary Content Responsibility

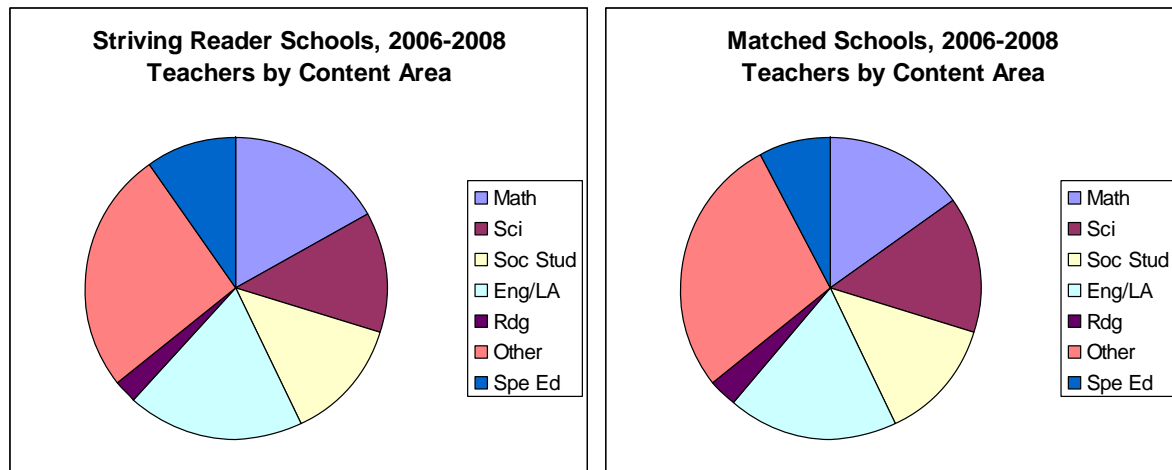
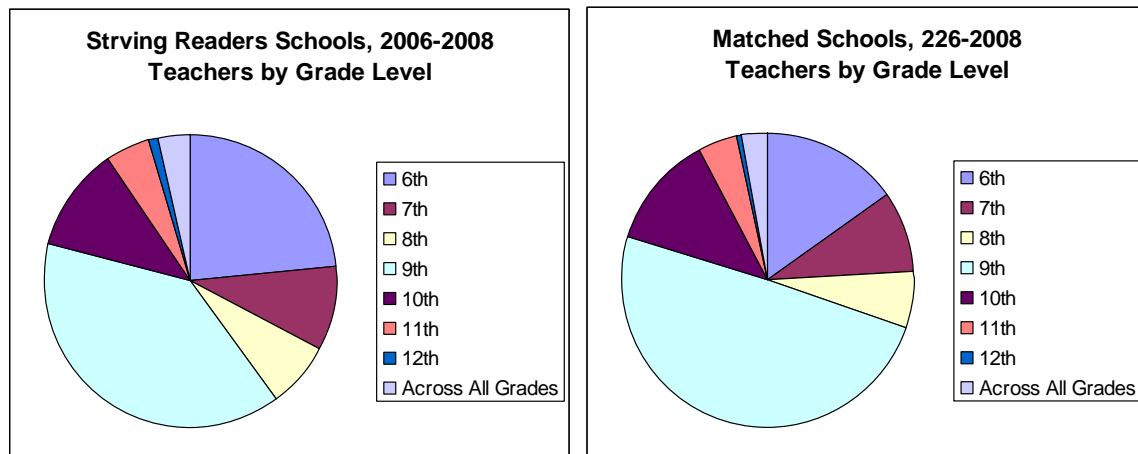


Figure 1.2

Striving Reader and Matched Schools Teachers' Primary Grade Level Responsibility



Impacts on Teachers at the End of Two Years

Impacts on Teacher Efficacy

The school-wide intervention teachers' efficacy was measured using the Teacher Efficacy Survey. Data were gathered prior to training in the summer of 2006 and again in the summers of 2007 and 2008. Table 2.4 displays the means and standard deviations of Striving Readers and matched comparison content area teachers' self-reported personal and collective efficacy.

Table 2.4

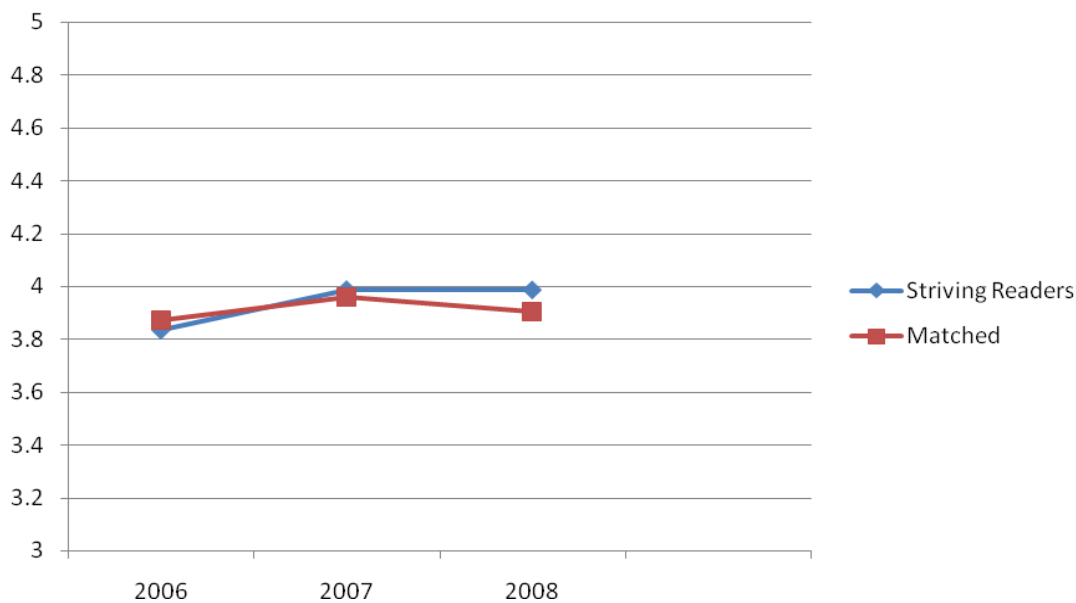
Means and Standard Deviations on Personal and Collective Efficacy Subscales of the Teacher Efficacy Survey for Intervention and Comparison Groups Across Time

Teacher Efficacy Subscale	Year	Condition	Number of Content Teachers	Mean/ Std. Dev.
Personal Efficacy	2006	Striving Readers Schools	757	3.8 (.59)
		Matched Schools	319	3.9 (.53)
	2007	Striving Readers Schools	720	4.0 (.51)
		Matched Schools	207	4.0 (.52)
	2008	Striving Readers Schools	581	4.0 (.67)
		Matched Schools	199	3.9 (.62)
Collective Efficacy	2006	Striving Readers Schools	754	4.0 (.67)
		Matched Schools	316	4.2 (.68)
	2007	Striving Readers Schools	714	4.2 (.63)
		Matched Schools	207	4.1 (.64)
	2008	Striving Readers Schools	576	4.2 (.60)
		Matched Schools	203	4.1 (.69)

The personal efficacy averages over time are illustrated in Figure 2.1, and the collective efficacy averages are illustrated in Figure 2.2. Figure 2.1 shows that Striving Readers teachers had slightly lower personal efficacy in the summer of 2006 than the teachers at the matched schools. However, by the summer of 2008, the Striving Readers teachers had slightly higher personal efficacy than the matched school teachers.

Figure 2.1.

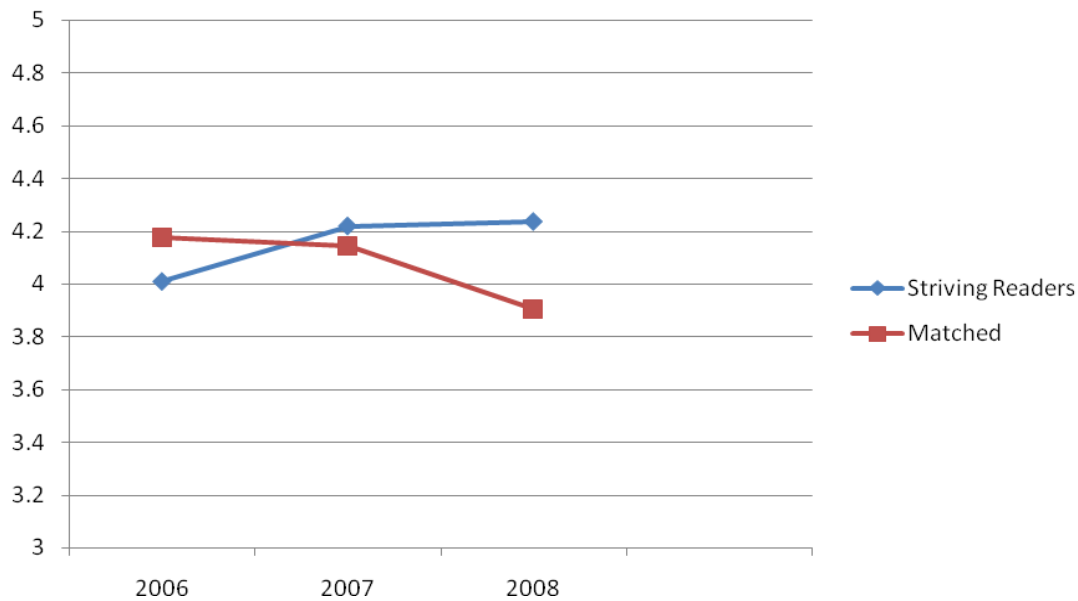
Means of Teachers' Self-Reported Personal Efficacy as a Function of Time and Treatment Condition



A somewhat similar trend can be seen in Figure 2.2, showing that teachers in the Striving Readers schools began with lower collective efficacy than the teachers at matched schools and by the summer of 2008 had higher collective efficacy. However, a fairly steep decline in collective efficacy of teachers at matched schools between 2007 and 2008 is evident. This decline was not shown as sharply in the personal efficacy data.

Figure 2.2.

Means of Teachers' Self-Reported Collective Efficacy as a Function of Time and Treatment condition



Regression analysis was used to estimate the effect of ALM treatment at Striving Readers schools over time on teachers' personal and collective efficacy. The regression model was as follows:

$$F_{ij} = \beta_0 + \beta_1(T_i) + \beta_2(Y_i) + \beta_3(T_i * Y_i) + \varepsilon_{ij}$$

where

F_{ik} is the teacher efficacy subscale scores for school treatment group i during summer k ;

β_0 is the mean teacher efficacy subscale score for matched schools in 2007,

β_1 is the average Striving Readers teacher efficacy subscale score, where;

$T_i = 1$ if teacher is in SR school and 0 if in matched school

β_2 is the average teacher efficacy subscale score for summer k , where;

$Y_k = -1$ for summer 2006, 0 for summer 2007, and 1 for summer 2008.

β_3 is the interaction coefficient for treatment by year, where

$Y_1 * T_1 = -1 * 0 = 0$ for teachers in matched schools in 2006

$Y_1 * T_2 = -1 * 1 = -1$ for teachers in Striving Readers schools in 2006

$Y_2 * T_1 = 0 * 0 = 0$ for teachers in matched schools in 2007

$Y_2 * T_2 = 0 * 1 = 0$ for teachers in Striving Readers schools in 2007

$Y_3 * T_1 = 1 * 0 = 0$ for teachers in matched schools in 2008

$Y_3 * T_2 = 1 * 1 = 1$ for teachers in Striving Readers schools in 2008

ε_{ik} is the random effect in teacher efficacy in treatment group i at time k . These residual effects are assumed normally distributed with mean 0 and variance σ^2 .

Table 2.5

Regression Results for Teacher Personal Efficacy Subscale

	Personal Efficacy				
	B	SE	β	<i>t</i>	<i>p</i>
Personal Efficacy	3.91	.021	--	188.9	.000
Treatment (T_i)	.038	.024	.030	1.586	.113
Year (Y_i)	.021	.024	.031	.851	.395
Interaction ($T_i * Y_i$)	.074	.028	.094	2.594	.010

Teacher personal efficacy can be estimated using the formula:

$$\text{Est of } F_{ij} = 3.910 + 0.038 (T_i) + 0.021 (Y_i) + 0.074 (T_i * Y_i)$$

Where

T_i = 0 at matched schools and 1 for Striving Readers schools, and

Y_i = -1 for summer 2006, 0 for summer 2007, and 1 for summer 2008.

However, only the interaction term is significant, indicating an increase in teacher personal efficacy at Striving Readers schools. Also, the adjusted R^2 of 0.014 is extremely small, indicating that very little of the variance in the data is explained by the regression model.

Table 2.6 shows the regression results for modeling the teacher collective efficacy.

Table 2.6

Regression Results for Teacher Collective Efficacy Subscale

	Collective Efficacy				
	B	SE	β	<i>t</i>	<i>p</i>
Collective Efficacy	4.13	.024	--	169.7	.000
Treatment (T_i)	.018	.028	.012	.630	.529
Year (Y_i)	-.054	.029	-.068	-1.891	.059
Interaction ($T_i * Y_i$)	.169	.034	.182	5.049	.000

Teacher personal efficacy can be estimated using the formula:

$$\text{Est of } F_{ij} = 4.134 + 0.018 (T_i) - 0.054 (Y_i) + 0.169 (T_i * Y_i)$$

Where

T_i = 0 at matched schools and 1 for Striving Readers schools, and

Y_i = -1 for summer 2006, 0 for summer 2007, and 1 for summer 2008.

Although the decline in collective efficacy of teachers over time at matched schools is expressed by the negative β_2 term (-0.054) with a p-value of .059, the interaction is the only term significant at the $\alpha=.05$ level, indicating an increase in teacher collective efficacy at Striving Readers schools. Also, the adjusted R^2 of .015 is also extremely small, indicating that very little of the variance in the data is explained by the regression model.

Conclusions

In the first two years of this Striving Readers project, literacy coaches, administrators, and content area teachers achieved adequate levels of participation in the professional development inputs, overall, for both the targeted intervention and whole-school model. However, there was more variation in the levels of classroom implementation of the targeted and whole-school interventions. For the targeted intervention, classroom implementation was relatively low in year one but improved to adequate levels in year two. For the school-wide model, implementation by E/LA teachers decreased in year two and implementation among middle-school teachers of other content areas was adequate in year two.

While levels of classroom implementation fidelity to the models have been inconsistent, the first two years of the Striving Readers project have yielded positive impacts on students and teachers. In particular, the targeted intervention (LSC) seems promising for improving the reading strategy use of sixth-grade struggling readers. In addition, LSC had a positive effect on both sixth- and ninth-grade students' reading motivation. While the targeted intervention appeared to have no impact on students' reading achievement in years one and two, there was insufficient power to detect these impacts. The impact analysis for this study requires four years' data collection to achieve sufficient power, and thus the student outcome results reported here are inconclusive. Impacts on student achievement may be realized in future years of this Striving Readers study.

The design of this study provides a number of insights regarding the LSC. First, the study shows promising results for examining the impact of the LSC as a set of coherent strategies rather than studying the impact of each component individually. Second, findings from this study suggest that the LSC has positive benefits not only for students receiving special education services, but also those in regular education. Finally, this study provides empirical evidence about the impact of the Learning Strategies Curriculum using a randomized pretest-post-test control group design with larger numbers of students than had been available in previous studies.

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